



The Critical Influence of Machine Translation on Foreign Language Education: A Prospective Discourse on the Rise of a Novel Instructional Landscape

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Received: 03/19/2023; **Accepted:** 08/14/2023; **Published:** 09/13/2023

Abstract: This treatise explores the philosophical implications of the impact of machine translation on foreign language education. Rather than delving into technical details, it scrutinizes the theoretical ramifications of regarding machine translation as a means of thought. This article aims to articulate the theoretical potential of machine translation and to increase awareness of its significance. It posits that the advent of machine translation has the potential to challenge native linguistic intuition, which traditional corpus linguistics has been unable to achieve. This is attributed to machine translation's unique features, including (1) its conversion from bad model to good model, (2) its capability for production, and (3) its mediation by the use of the native language. These peculiarities may pose a threat to native speakers' linguistic intuition and may, in some cases, surpass it. Finally, this article speculates on the possible impact of these theoretical implications on the practice of foreign language education and suggests the potential emergence of a new instructional paradigm characterized by the extensive use of the mother tongue in a backcasting manner.

Keywords: *Machine Translation, Disenchantment, Native Intuitions, Foreign Language Learners, Philosophic Implications*

Introduction

The utilization of artificial intelligence (AI)-powered machine translation is revolutionizing foreign language education. While language proficiency encompasses four skills—speaking, listening, reading, and writing—it is writing that is most directly impacted. However, as machine translation enables listening, reading, and speaking as well, the reach of its effect is extensive. The authors, specializing in tertiary English education and restricting their research to university students, observe that globally, university students are likely cognizant of the existence of machine translation and utilize it as a valuable resource (cf. Clifford, Merschel, and Reisinger 2013) (even if its employment in language classes is prohibited, it can still be utilized in other contexts).

It is well-known among educators that students resort to utilizing machine translation. In the past, efforts to counteract the influence of machine translation were made by devising instructional methods that circumvented its use, such as the “Google-irrelevant classroom” (Urlaub and Dessein 2022; Ducar and Schocket 2018; Henshaw 2020). However, with the substantial advancements in neural machine translation performance, it is becoming increasingly difficult to view it as an adversary. A review of foreign language education conference themes reveals that machine translation is a recurrent keyword, implying that it

holds a significant level of interest among language instructors (e.g., “Machine Translation Frontiers” in AAMT 2022 Tokyo [December 1, 2022], “On Stage or Backstage—Visibility of Translation and Interpretation” in IJET-31 [June 24–25, 2023]).

However, a challenge arises as machine translation and foreign language education seek to coexist. Despite efforts to integrate technology in the classroom, educators remain uncertain of the most effective means of utilizing machine translation in language instruction. A limited body of research exists on the practical application of machine translation in foreign language education, with many educators still exploring various pedagogical approaches to how machine translation can develop learners’ foreign language skills (cf. Vermes 2010; Niño 2009; Klimova et al. 2022; Case 2015). As a result, the field of study remains in its nascent stage, in terms of both theory and practice.

This article endeavors to examine the impact and relevance of machine translation in foreign language education from an applied linguistic perspective, as the field is in a state of “uncertainty.” The objective of this article is to provide guidance to language educators on how to effectively incorporate machine translation into their curriculum. Despite the sensationalist claims that machine translation will render foreign language education and translators obsolete (cf. Cadwell et al. 2016; Gally 2018), this article aims to dispel such misconceptions while acknowledging the significance of machine translation in the realm of language education. To date, limited research has explored the theoretical implications of machine translation, making this article a valuable contribution to the field by presenting the first insights into this topic. The hypothesis put forth in this article, that a systematic and organized approach to machine translation and foreign language education will result in more efficient outcomes, awaits further verification in future studies.

Machine Translation’s Philosophical Impact on Native Intuitions

Initially, let us commence by exploring the philosophical ramifications that the advent of machine translation may have on foreign language education, not in terms of technical details but in terms of its theoretical impact as a concept. Similarly, the internet has been examined interdisciplinarily as an idea rather than merely a technological theory of computer networks.

In the domain of foreign language education, the integration of information and communication technology (ICT) has become a necessity. It is increasingly apparent that traditional foreign language classrooms relying solely on pen-and-paper pedagogy are obsolete and unlikely to engage learners effectively. The implementation of ICT in foreign language education to enhance the quality of learning is a rapidly burgeoning area of research, and it is challenging to voice any objections to the utilization of ICT in foreign language instruction itself (cf. Alkamel and Chouthaiwale 2018).

In reality, numerous ICT-based learning tools have been proposed, and a profuse number of academic reports have documented their evaluation and implementation. These tools encompass AI applications that enhance pronunciation via speech recognition (e.g., ELSA

Speak¹), a plethora of e-learning resources for TOEFL and IELTS preparation, and writing support systems for English language learners, such as software that detects plagiarism, checks grammar, and automatically assesses essays (e.g., Turnitin² and ETS Criterion³). As a result, there are numerous well-conceived ICT-based tools and applications available, and their effective utilization can enhance learner autonomy and optimize the learning process (cf. Ghasemi and Hashemi 2011).

It is certain that if machine translation were only one of these new tools, it would have been more readily understood and accepted by the public and would have been more readily incorporated into the educational community (cf. Urlaub and Dessein 2022). The fact that this is not the case is what has made machine translation a matter of controversy and division, causing a large number of teachers to adopt a wait-and-see approach. Therefore, what distinguishes machine translation from the already existing English language support applications? Perhaps there is a fundamental difference that makes machine translation unsuitable or inappropriate for discussion in the context of the effective implementation of ICT in education. In essence, this difference may lie in the potential to disenchant native intuitions.

The Resplendence of a Native Speaker's Intuition

In his seminal work on linguistics, Chomsky (1957) famously demarcated the divide between semantics and syntax, a concept widely recognized as fundamental in the field.

(1) Colorless green ideas sleep furiously.

(2) *Furiously sleep ideas green colorless.

It is fair to assume that neither sentence (1) nor (2) (nor indeed any part of these sentences) has ever occurred in an English discourse. Hence, in any statistical model for grammaticality, these sentences will be ruled out on identical grounds as equally “remote” from English. Yet (1), though nonsensical, is grammatical, while (2) is not grammatical. (Chomsky 1957, 15)

This article does not delve into the intricacies of syntax, but briefly, the contention in sentence (1) is that while grammatically sound, it lacks semantic validity, and thus constitutes an example of “nonsense” and “unrealistic” language that is deemed unacceptable. Chomsky (1957, 1965, 1986) posits that the rarity of such sentences in English discourse, resulting in an infinitesimal probability of occurrence, contributes to their “remote” nature.⁴ This raises the question of how we can determine the “remoteness” of such utterances from the English language. The answer lies in the long-standing debate surrounding “native intuitions,” as

¹ See: <https://elsaspeak.com/en/>.

² See: <https://www.turnitin.com/>.

³ See: <https://www.ets.org/criterion/about.html>.

⁴ Chomsky asserts that sentences (1) and (2) are equally “remote;” however, this viewpoint is contested from a statistical perspective (cf. Pereira 2000). Some scholars, drawing upon the work of C. M. Street, argue that sentence (1) also has “rational uses,” which does not necessarily entail its impossibility in reality (Hinzen 2014).

discussed (cf. Slezak 2014; Gass 1983; Fitzgerald 2010; Maynes and Gross 2013; Siyanova-Chanturia and Spina 2015; Rogers et al. 2015). Native intuitions pertain to an individual's inherent understanding of the mechanics of their native language, acquired without explicit grammatical knowledge. However, it is essential to recognize that this concept can occasionally give rise to an exaggerated notion known as the "native speaker myth" (Phillipson 1992). This article aims to explore this topic further.

Chomsky (1957, 1965, 1986) asserts that linguistic evidence relies heavily on the assessment of native speakers. He either implicitly or explicitly espouses the notion of native speakers as possessing a superiority in the utilization, examination, and evaluation of language, and the existence of an insurmountable "barrier" for those who learn it as a foreign language. Consequently, nonnative speakers are unable to attain full mastery of the target language, and the objective should be to approach native proficiency as closely as possible. This perspective gave rise to the concept of "interlanguage" as proposed by Selinker (1972) and has perpetuated the perception of nonnative speakers as being inferior to native speakers, as the latter's mother tongue can interfere negatively in foreign language acquisition or persist in a fossilized state, leading to ongoing error analysis (Corder 1967). Despite efforts to dispel these beliefs (cf. Selinker and Rutherford 1992), the dominance of native speakers with innate linguistic abilities remains unchallenged.

Resistance from Corpus Linguistics

However, when examining the historical evolution of applied linguistics, nonnative speakers have devised methods to challenge native speakers' native intuition and achieve a state of parity with them (e.g., Reis 2011). This is precisely the objective of corpus linguistics. While native speakers judge their native language based on introspection, a corpus comprises an abundant amount of empirical data. The advent of advanced computer processing and improved concordance functions has enabled corpora to store more linguistic data than a single native speaker could manage in their lifetime. Where native speakers rely on intuition, the corpus promptly retrieves several instances of actual usage from the vast pool of language data from the past. As long as multiple examples are available, it can be established that it is actually used, which represents a revolutionary moment for nonnative speakers to contend with native speakers in the same sphere (cf. Conrad 2000; Cruse 2004).

Despite expectations, corpus linguistics has not surpassed native intuitions. This may be due to the modest approach of corpus linguistic researchers, who may not wish to incite unnecessary conflict. Corpus linguistic researchers, such as those cited in the article by Verlinde and Selva (2009), adopt a contemplative stance, acknowledging the usefulness of evidence from native speakers while recognizing the immaturity and insufficiency of corpus data. The inductive corpus data do not surpass or even attempt to surpass the deductive intuition of native speakers. Although this stance is suitable for research purposes, in the larger context, the superiority of native speakers remains firmly entrenched and the inferiority of second language speakers remains unchallenged, even with the advancements in corpus linguistics.

Why has corpus linguistics failed to surpass the intuition of native speakers? This may be due to the aforementioned researchers' attitude, but the primary limitation of corpus linguistics lies in its utilization as an analytical tool rather than a predictive one. Despite recent advancements, corpus linguistics has primarily been utilized for retrospective discussions of the past, while its ability to generate predictions for the future remains underdeveloped.⁵ Although advancements have been observed within corpus linguistics, they have yet to pose a substantial challenge to the dominance of native speakers.

Resistance from Machine Translation

The astonishing improvement in machine translation in recent years has been facilitated by the implementation of neural translation frameworks. The widespread adoption of machine translation, in part due to its affordability or free availability, has previously been noted. This article posits that machine translation constitutes a paradigm shift distinct from prior technology-assisted software or applications and the accompanying applied linguistics research, and constitutes a substantial development leap. The distinctiveness of machine translation alone shall be discussed in further detail as follows.

Transition from a Bad Model to a Good Model

Yamada (2019) posits that machine translation, in its current state, has evolved into a more favorable model for guiding foreign language acquisition, as opposed to its previously detrimental impact. The essential argument is that the sentences produced through machine translation in the target language surpass those generated through the learner's individual proficiency and can serve as a model for learning.

An instance of an efficacious English writing support tool is Grammarly,⁶ which provides a free version that identifies fundamental grammatical errors and word usage, along with spelling errors, while the paid version offers comprehensive features such as word selection, tense, and suitable prepositions. These services offer constructive feedback to foreign language learners with regard to the English sentences they independently generate, leading to a substantial improvement in their written English proficiency. However, these services are predicated on the assumption that the initial sentence was crafted by the learner, only making "corrections" to the original sentence. Thus, if the text deviates from the intended purpose to a considerable extent, there may be limitations in the extent of revisions that can be made.

Machine translation, however, can generate a sentence that aligns with one's intended meaning, relying solely on the individual's mastery of their mother tongue, even in cases where no knowledge of the target language exists. As previously discussed in the section on native intuitions, the mastery of one's native language is considered to be "innate," and thus

⁵ Rather, the discussion often seems to confine itself to how appropriate the data set is (e.g., Dash and Arulmozi 2018; Takaie 2002).

⁶ See: <https://www.grammarly.com/>.

accessible to anyone. Given that it is uncommon for a learner to attain a “native-like” proficiency in a foreign language, the output of machine translation often surpasses the level of linguistic proficiency attainable through extensive study. Machine translation has the capability to perform seemingly impossible tasks, such as creating a sentence from nothing, and can effortlessly generate complex and sophisticated phrasing that a learner may only dream of. It must be acknowledged that machine translation is prone to errors, and one should exercise caution in placing absolute trust in its outputs (cf. Harris 2010). Nevertheless, there are certainly instances where the results can be trusted completely, and it is evident that machine translation far surpasses the level of support and correction provided by Grammarly. The requirement for linguistic competence to produce the original sentence in the target language is no longer a necessity with machine translation.

Production Capability

As one of the major characteristics of machine translation, it is capable of producing an infinite number of new sentences. This point is easy to understand when considering corpus linguistics. Corpus linguistics has been able to analyze and research databases that have been generated and collected in the past, but it has not been a research field that specializes in producing new sentences in the future. Of course, it is possible to find certain rules and trends from past corpora, but only to some extent. On the other hand, machine translation is the large-scale development of results based on distributional semantics using AI computers (cf. Cohen and Widdows 2009), and machine translation can produce specific language production based on corpora. Of course, it cannot yet produce language autonomously from no input, as humans do, using its own thinking, but it can input one language and produce another without pause. It will be seen that leakage is no longer at the level of support for learning, represented by feedback in the educational sense. Aside from whether this is learning or not, machine translation can indeed be the mainstay of the transmission work in communication, and in conjunction with the previous discussion, the quality is not “bad” at all.

Intervening Use of Mother Tongue

Another point where the nature of machine translation differs significantly from existing teaching methods from an applied linguistic (foreign language acquisition) perspective is that it is based on the active use of one’s native language. According to the trend in foreign language learning, the mainstream view is that it is “undesirable” to involve the first language in language learning. This is because, as Cook (2010) points out, teaching a foreign language in one’s first language is reminiscent of the “Grammar Translation Method,” a once unpopular and now defunct teaching method, and the subsequent Audio-lingual Method, Communicative Language Teaching, and now Content and Language Integrated Learning, all of which basically do not assume the active use or intervention of one’s native language. A former criticism leveled at the Grammar Translation Method was that it lacked the

communicative aspect that makes it suitable for analysis but not for use.⁷ It is for this reason that foreign language teaching methods have aimed at enabling students to think in the target language and act like native speakers without having to translate each time they speak the target language (cf. Cook 2010). This is consistent with the discussion of the negative influence of the native language in the theory of interlanguage.

Machine translation, however, is a “translation,” and as such, it naturally encourages the active use of one’s first language. While native language can be used for both input and output, there are machine translators that provide back translation as a standard feature (e.g., Mirai Translator⁸), and by using these in an integrated manner, it is possible to preedit and postedit the subtle nuances and differences in meaning of expressions in the target language that one wishes to produce, using knowledge of the native language and even native intuitions. It is not easy to further improve what one produces using one’s own target language with one’s own ability, but by intervening with translation in one’s native language, one can easily revise and improve the quality of the output. In machine translation, the mother tongue is not an obstacle, but rather an indispensable prerequisite for increasing the level of output. As pointed out earlier, the field of foreign language teaching, especially English, has long been active in research on teaching methods that either exclude the use of the mother tongue or place it in a complementary position to the target language (cf. Turnbull 2002). There has not yet been much research on how to incorporate the advantages of the first language strategically and proactively and use it as the primary medium for foreign language learning, which may leave the field unexplored.

The Impact of Machine Translation on Native Speaker Status

The characteristics discussed previously are not currently found in any other English language teaching technology. In this sense, machine translation is indeed “different,” but will it really have any impact on native intuitions, which is the target of this article? In the following, let us examine this point.

The basic premise is that the performance of machine translation continues to improve, and we should not assume that just because mistranslations happen to occur now, they will continue to occur forever. On this assumption, the authors believe that machine translation has great potential to drag down the status of native speakers with native intuitions. To begin with, the target language sentences produced by machine translation cannot be grammatically ungrammatical, because machine translation refers to a database as a good model, and at least at this point, all syntactic errors can be resolved in the future theoretically (cf. Wang et al. 2022).

Next is the content aspect (i.e., semantics). Distributional semantics is based on probability theory, and if certainty is raised to the utmost limit, the production will no longer be uncomfortable for people to see. Of course, since it is a matter of probability, sometimes

⁷ For example, Brown (2014, 16) states, “It does virtually nothing to enhance a student’s communicative ability in the language.”

⁸ See: <https://miraitranslate.com/en/>.

native speakers will “win.” In most cases, however, machine translation and native speakers will both return outputs that are hard to match, and all that is required is for machine translation to increase the percentage of time that this “equilibrium state” prevails. Thus, at this point, we can say that the foreign language learner, armed with the “weapon” of machine translation, has improved their production capacity to the extent that they can produce output that is equal to or (sometimes) slightly inferior to that of a native speaker in terms of statistical probability (cf. Westera and Boleda 2019).

Furthermore, consider foreign language learners. The machine translator inputs the equivalent in their first language as “material” for the target language they wish to output. In this case, the foreign language learner can use back translation to check the quality and nuance of the output expressed in the target language and whether it deviates from what was originally intended in the native language. If there is a gap with the intended meaning or, in the worst case, the opposite meaning, the output can be corrected by looking at the results of the back translation in the first language. Can a native speaker of the target language with native intuitions do the same thing? Although native speakers of the target language might be able to “polish” the presented output using native intuitions, it is not easy to correct the degree to which the learner’s original intention in the native language is expressed in the target language or to correct the discrepancies and nuances (cf. Lev-Ari 2015). This is because, although obvious and interesting at the same time, native speakers of the target language with native intuition are not native speakers of the learner’s native intuition. We do not deny that it is possible to infer this to a certain extent, but, like Grammarly, it is only possible to brush it up with reference to the “original sentence.” It is impossible to translate into language what the learner wanted to say, without telepathy, which is not expressed at all in the production. At this point, machine translation exceeds the capabilities of native speakers of the target language.

Thus, the privileges of native speakers are threatened by the advent of machine translation, while at the same time, the productivity of nonnative speakers is greatly enhanced, opening up the possibility of native speakers and nonnative speakers standing side by side and exchanging not the quality of language but its content on an equal footing. This is what this article calls the disenchantment of native intuitions. Disenchantment is a term originally used by Max Weber to refer to the rationalization in the modern era, but in this article, the “atmosphere” in which native speakers are unconditionally praised and learners are made to feel as if their purpose is to be assimilated by them is considered as magic, and this composition is considered dismantled. Coincidentally, the fact that DeepL,⁹ one of the leading machine translation engines in existence today, was developed and is being operated in Germany, a country that is not a native speaker of English, shows that this is not a mere prophecy.

The “English” under discussion here is no longer English for native speakers, that is, no longer English as the property of native speakers, but English as a commons that is no longer in the hands of native speakers and belongs to no one. To borrow Kachru’s (1986) distinction,

⁹ See: <https://www.deepl.com/en/translator>.

the English of the “inner circle” is no longer the norm. In other words, it is not an English that relies on native intuitions, as Chomsky assumes. With machine translation, everyone will have access to English as a commons, which will differ from the English of native speakers, and they will in turn have to make adjustments. In other words, the norm will be the English produced by machine translation, and as strange as it may sound, it is expected that humans will adjust to machine-translated English (cf. Maeda 2019). At the very least, this will be more favorable to nonnative speakers and will accelerate the disenchantment of native intuitions.

The Theoretical Impact of Machine Translation on Language Teaching

In the following section, we will discuss the possible educational implications of the philosophical impact discussed in the previous section and how it has the potential to change the actual foreign language education in the future. A first point to note is that the possibilities opened up to foreign language learners by machine translation are not necessarily directly related to the content of foreign language education, and we must be cautious about this point. Previously, we pointed out that foreign language learners may finally be able to communicate on an equal footing with native speakers, and their productivity may be greatly enhanced by having machine translation in their hands, but this does not mean that foreign language learners have acquired the same level of English proficiency as native speakers. In other words, under “unarmed” circumstances, that is, when machine translation is not available, there is an overwhelming difference in production capacity in the target language, and foreign language learners are completely toothless in situations where they are not prepared using machine translation such as spur of the moment situations or real-time interactions in an asynchronous environment. What we should not forget is that it is one thing for a foreign language learner to debut on a stage where they can use machine translation to interact with native speakers competently, and it is another thing for a foreign language learner to develop operational competence in the target language; therefore, the philosophical impact discussed earlier does not immediately lead to the argument that education is no longer necessary. This is because the utilization of machine translation in isolation does not yield an instantaneous enhancement in the learner’s English proficiency. Furthermore, the effective integration of machine translation into the learning process does not inherently obviate the necessity for educational endeavors directed toward the autonomous cultivation of the learner’s English competence. No matter how much machine translation will penetrate society in the future, it would never be acceptable to work on TOEFL¹⁰ or IELTS¹¹ tests using machine translation, so cultivating foreign language skills without machine translation will continue to be indispensable. As long as English language assessment products persist in gauging the personal English language proficiency of individual learners, and as long as these diagnostic evaluations effectively deliver informative

¹⁰ See: <https://www.ets.org/toefl.html>.

¹¹ See: <https://www.ielts.org/>.

insights to aid in their learning process, the importance of instructing students in the cultivation of their own English language proficiency will continue to be undisputed. In other words, it is wrong to deny foreign language education.

On the other hand, it is clear that advances in machine translation interfaces are likely to reduce the number of situations in which users will be forced to respond “unarmed” without machine translation. The real-time transcription function of today’s videoconferencing systems, combined with voice input and machine translation, will make it possible to use machine translation in more and more situations, even in a synchronous environment. In other words, from now on, foreign language use environments coexisting with machine translation could be prepared in many situations, and in this sense, it does not seem necessary for all people to train foreign language skills in an “unarmed” condition. Depending on the institution and the circumstances of the target learners, learning how to use machine translation more effectively and efficiently and being able to “practice” that experience in school will be more valuable in many cases than engaging in traditional “unarmed” training of foreign language skills.

However, if we are genuinely serious about the philosophical impact of machine translation as described in this article, we can go a step further and make some suggestions. Machine translation can be taken in stride to a state where native speakers and nonnative speakers can retain comparable language operational skills, rather than the traditional model of chasing the mirage of the language skills of native speakers that cannot be reached anytime soon. At least that is how this article sees it, which is a phenomenon that could not have occurred in previous foreign language studies. That is why, instead of the traditional educational approach of chasing a mirage while gradually developing one’s abilities, there had better be a learning style that backtracks from the goal point and uses plenty of mother tongues to learn detailed adjustments in a retrospective manner. These horizons are completely unexplored, and neither teaching materials nor teaching methods have been developed. Allowing ourselves to propose a specific recommendation, the growing influence of AI as an exemplar for learners implies that personalized autonomous learning aligned with each individual’s proficiency level will acquire greater significance in the years to come. This implies a departure from the conventional expectation for educators to administer uniform instruction, potentially rendering the conventional notion of pedagogical approaches obsolete. Consequently, the wait for the “establishment” of definitive teaching materials and methodologies is unnecessary. Instead, proactive exploration and the global dissemination of these practices emerge as the pivotal need. Additionally, the formulation of targeted “strategies” for foreign language learners could prove beneficial. For instance, occasionally intentionally modulating the output of machine translation to align with personal comprehension and practical utility, while simultaneously integrating it with self-generated English to enhance manageability. This article believes that it would be more constructive for those involved in foreign language education to focus on the new educational stage opened up by machine translation, rather than dismissing it out of hand as “using machine translation is not education.”

Conclusion

Finally, we would like to close by stating the limitations of this article. This article is only an outlook from a theoretical point of view, and specific examples of how actual educational settings would change await future empirical research. In addition, the impact of educational and socioeconomic backgrounds on native intuition has been previously highlighted (e.g., Alderson 2007; McGee 2009); however, this study did not delve into any of these aspects. This subject constitutes a potential area for future research.

On the other hand, this article is an attempt to unravel the theoretical impact of machine translation and why it is gaining so much acceptance in today's world, where the use of machine translation is sweeping the real world and this trend is becoming too much to be ignored. We believe that we have provided some food for thought for those researchers and educators who are unsure of how to incorporate machine translation into language learning.

Should this article be able to show that the impact of machine translation is not limited to the translation industry or the field of foreign language education, but that it is a potential starting point for the sublimation of AI into any area that can be achieved by AI, the authors, who emphasize the interdisciplinary and transdisciplinary nature of machine translation, would be more than happy.

Conflict of Interest

The authors declare that there is no conflict of interest.

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